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ABSTRACT

the factors which maximize response rates, both through reducing refusals and increasing the probability that respondents will be available for interview, were studied in rural California. Phone directories were used to generate a sample of 250 households who were contacted on either of two evenings or Saturday. The interview questions concerned community attitudes and knowledge of the county 4-H program. The interviewers included professional 4-H staff, adult volunteer club leaders, and 4-H members aged 14-17. For three calling sessions, 591 phone calls were made. They resulted in 241 completed interviews, 99 refusals, 167 no-answers, 52 busy lines, and 32 cases when an adult was not available. The completion rate was 41 percent, with 28 percent of the households empty. The refusal rate, which was acceptable, was calculated to be 29 percent. Results of the analyses indicated that the likelihood of contacting targeted households and of completing interviews was not influenced by those situational properties that were examined: day of the week, male versus female interviewer, or experience of interviewer. This study replicated the research findings which were used in designing the survey and in training the interviewers. (GDC)

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RESPONDENT AVAILABILITY AND COOPERATION IN TELEPHONE SURVEYS: AN INVESTIGATION OF POSSIBLE INFLUENCES

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Presented at the annual meeting of the American Educational Research Association, San Francisco, April 1986

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An important concern of telephone survey researchers has been to maximize response rates, both through reducing refusals and increasing the probability that respondents will be available for interview. Two frequent questions are what time periods are best for calling and whether interviewer characteristics of various kinds influence the refusal rate. This paper presents an analysis of these issues, respondent availability and cooperation, that resulted from a telephone survey of a rural county in California.

Several reports on these topics have appeared, but generalizability has frequently been limited by specific characteristics of studies such as the season in which data were collected, the identity (and perceived legitimacy) of the sponsoring group, the region in which calls were made, the type of contact (i.e., face-to-face vs. telephone),the length of the survey and the sensitivity of the items. For these reasons, no one study will prove wholly generalizable to all settings. However, the examination of a variety of settings will allow survey researchers gradually to build confidence regarding the best ways to resolve these logistical decisions.

The specific questions addressed by this paper are the following:

(1) How are cooperation and availability related to the time of week in which calls are made?

(2) How is cooperation related to the sex of the interviewer?

(3) How is the degree of cooperation that is obtained from contact households (i.e., completion vs. refusal) related to characteristics of the interviewer (staff member, volunteer adult, or volunteer adolescent)?

Review of Literature

Period in which contacts are made. There have been several large-scale investigations of the times in which households should be contacted. Weeks, Jones, Folsom, and Benrud (1980) screened over 22,000 households (through interviewer visits), and provided probabilities for finding an adult defined as age 14 or older at home for every hour of each day between 8:00 a.m. and 10:00 p.m. They concluded that 5-9 p.m. Sunday through Friday and 10 a.m. - 5 p.m. Saturday are the best times for finding an adult at home. Figures are presented for overall findings, urban/rural characteristics of area, and race of household. Standard errors for the at-home proportions were provided, but no statistical tests for differences between various days or times were reported.

Vigderhous (1981) provided a second extensive database, resulting from telephone interviews in Ontario and Quebec provinces by the Canadian Telephone Company. Using logit analysis of records from all months of the year, Vigderhous found, in general, no strong differences between weekdays. The best hours to find people at home were in the evening, particularly 6:00 to 7:00 p.m. An important limitation of this study was that Saturdays and Sundays were not examined.

Falthzik (1972) provided data on the success of interviewing housewives or female heads of households in the morning,afternoon, or evening across all days of the week. He concluded that mornings are the best times, followed by evenings and afternoons respectively. Among days of the week, he concluded that Monday through Thursday are best and Friday worst. Falthzik did not make his screening procedure explicit, so one must presume that if a male

was present but no female, the case was counted as a "not-at-home." Since the intended audience was inconsistent with those of the previous two, we don't have figures on the probability of finding any adult home, to be compared with the previous studies. In addition, national statistics on women in the work force have probably changed considerably since 1972, and thus this study's findings may be somewhat out of date.

Brunner and Carroll (1969) accepted the hypothesis that weekday evenings and Saturdays are best and went on to examine the relative proportions of not-at-homes and refusals between the two periods. The study involved home visits. Only completed interviews with an employed head of household were counted as completions. They found that refusals were more common on weekday evenings, while not-at-homes were more common on Saturdays; the best completion rate was found for weekday evenings. Figures were similar for data collected in May and in December. However, the data were collected in 1966, so they are quite dated.

It is evident that there are significant differences in the comprehensiveness of these studies which tend to limit their comparability. To summarize, some of the major differences are:

- Whether contacts were made by telephone or on-site.
- The stated purpose of the study. Vigderhous' survey, for example, conducted by the Canadian Telephone Company to assess satisfaction with telephone service, had direct implications for respondents' benefit; it may well have received more cooperation that the majority of telephone surveys.
- The definition of "eligible" respondent. Weeks et al. looked for household members 14 and older; Falthzik looked for housewives and female heads of households; Vigderhous did not specify the eligibility requirements; Brunner and Carroll looked for employed heads of households.

These considerations and others illustrate that it is probably not fruitful to look for a single paradigm study to determine when to contact people for survey participation. A researcher must examine the literature to look for general trends, as well as studies conducted under conditions similar to the intended one.

Sex of interviewers. The effect of interviewer characteristics on completion rates has also been reported by several researchers. Dillman, Gallegos, and Frey (1976) conducted three telephone surveys covering, in all, over 2,800 households in the state of Washington; they found that the sex of the interviewer was unrelated to the refusal rate in any of their studies. This finding was echoed by Tucker (1983). Freeman and Butler (1976) analyzed results from a face-to-face interview study, and found that female interviewers produced lower levels of interviewer variance than did males, which the researchers interpreted as a sign of greater reliability. However, this study must be considered in light of the facts that contacts were in-person, which could be expected to lead to greater interviewer effects than telephone interviews, and that the respondents were 80% female. Lowenstein and Varma (1970) also found lower interviewer variance for female interviewers. Further, as Frey(1983) observes, there seems to be a bias toward female interviewers by survey directors. Overall, however, most evidence from telephone survey studies does not support a difference in results between males and females.

Characteristics of interviewers. The three important classifications of interviewers that were used in the survey were staff member, adult volunteer, and adolescent volunteer. Consequently, this part of the review will focus both on interviewer experience and age as possible influential factors. There are strong intuitive grounds for presuming that there would be major factors in interviewers' success. Several studies, however, utilize inexperienced interviewers, e.g., participants in a college course (Freeman & Butler, 1976,

Brunner & Carroll, 1969, Dillman et al., 1976) and thus cannot explore that variable. Others (e.g., Tucker, 1983) examine the extent of interviewer effects without determining their cause. However, Singer, Frankel, and Glassman (1983) examined the variable of prior interviewer experience through classifications of no experience, under one year of experience, and one or more years of experience. Surprisingly, they found that interviewers in the third category had a significantly lower cooperation rate than interviewers in the less experienced categories. The authors were not able to account for this result. Overall, there is less evidence than might be expected on the interviewer experience issue, partly because in many studies the interviewers are from a homogeneous pool. More findings on this point are needed.

The age of the interviewer is somewhat better studied. Singer et al. (1983) used three categories of age: 18-21, 22-34, and 35+. They found that interviewers in the two older categories obtained similar response rates, but those in the 18-21 range were somewhat less successful in obtaining completed interviews. Freeman and Butler (1976) examined differences between interviewers 31 or younger and those over 31, for face-to-face interviews. They found more interviewer variance, and hence less confidence, for the older group. This finding must be viewed cautiously in terms of any implications for telephone interviewing.

In the present study, we wished to conduct a telephone survey of the community in a rural county to assess questions of importance to a local youth service program. Funds were not available to hire interviewers, and hence if the survey was to be conducted at all, we had to use individuals involved in the program. The groups from which the interviewers were drawn were professional staff, adult program, volunteers, and teenage participants. The first group

had some prior interviewing experience, while the latter two had none. No previous studies existed to advise us for the precise situation we faced; consequently we decided to conduct the survey and analyze our records afterward to determine the extent of interviewer effects.

Statistical analysis of studies. Although some studies (e.g., Weeks et al., 1980) presented their data without statistical comparison tests, most studies use the chi-square (X^2) test. Falthzik (1972) set up contingency tables of 12 and 4 degrees of freedom respectively, both of which showed significant X^2 statistics. He then decided on the pattern of significance by visual inspection rather than any post hoc tests. Dillman et al. (1976), in the three separate experiments they reported, also used X^2 tests to analyze their contingency tables, with visual inspection to analyze significant tests with more than 1 df.

A more precise method of analysis is to apply post hoc tests, in the case of a significant overall X^2, to determine where the important deviations from expectation lie. Post hoc ANOVA-like tests have not traditionally been available for X^2 analysis, but Zwick, Neuhoff, Maracuilo, and Levin (1982) have recently described such procedures. I believe they can be profitably used in survey analysis to upgrade the sophistication of interpretation of results, and to allow the use of more complex contingency table analysis.

Research Data

The survey investigated community knowledge and attitudes toward the county 4-H program in Yolo County, a predominantly rural county in central California. Calculations for desired level of sampling error led to the decision to obtain a sample of approximately 250 households from the county's overall population. Following the procedures recommended by Sudman (1976), a systematic sample of households was drawn, using all the phone directories

in the county. Eligible respondents included any adult in the household; household members were permitted to decide which adult would participate. In the case of no answer or a busy sisgnal, followups were made, up to a total of three attempts. The phone interview required from 5 to 10 minutes to complete.

Method

The telephone interviews were conducted in three sessions in November, 1984. The times chosen were Tuesday evening, Wednesday evening (both 6:00 p.m.-8:00 p.m.), and Saturday midday (11:00 a.m. - 1:00 p.m.), all during a single week. This sampling of time periods followed the recommendations of the studies discussed earlier.

The interviewing team consisted of five professional 4-H staff members, 14 adult volunteer club leaders, and six 4-H members between the ages of 14 and 17. The staff members worked at all three sessions, whereas the adult leaders and youth typically worked at only one or two. The calls were made from the Yolo County 4-H office.

Because most of the interviewers were inexperienced, we were particularly careful in structuring the calling sessions. On each occasion we conducted a preliminary training session for the interviewers, familiarizing them with the written protocol, the procedure to follow, and the answers to questions that we anticipated from respondents. All interviewers strictly followed the written script for the introduction and body of the interview. During calling periods, one of the 4-H staff members was always monitoring the calls in progress, in order to provide informational feedback to the interviewers when appropriate. Records were kept for each calling attempt and its results (completion, refusal, no answer, busy signal, etc.). In the case of busy signals and no answers, three attempts to reach the number were made, including

callbacks at the next calling session. By the end of the three calling sessions, 241 completed interviews had been obtained.

Results

Over all three calling sessions, there were 591 calls made, which resulted in 241 completed interviews, 99 refusals, 167 no-answers, 52 busy lines, and 32 cases where a child but no adult was home. Disconnected numbers, which were minimal, are excluded from the analysis. The completion rate, defined in most previous studies as completions divided by total sample, was 41%, which is somewhat low. This is mostly due to the high proportion of empty households: 28% of the total sample. This figure was probably due, in part, to the short calling periods - many of the other studies allocate several hours at a time, which was not feasible with our interviewing group. However, the refusal rate, defined as refusals divided by contacts (a fraction which should be minimized), was 29%, which when compared with other studies, is either equivalent (e.g., O'Neil, 1979; Singer et al., 1983) or better (e.g., Hagan & Collier, 1983).

To investigate the three questions posed earlier in the paper, contingency tables were examined using chi-square analysis. The results for Question 1 ("How are cooperation and availability related to the time period in which calls are made?") are shown in Table 1. For this analysis, five categories were used for the possible result of the call: completion, refusal, adult not home, no answer, and busy. Previous researchers have differed on the classifications for this question. For instance, Falthzik (1972) used only three - - completion, refusal, and not-at-home - - whereas Vigderhous (1981) used the five stated here as well as several others. For the present study, it was decided not to collapse the last three categories into one (i.e., "non-contact") because the post hoc test procedure was powerful enough to

accommodate the complexities of a large contingency table - - any significant X^2 could be followed up to identify the specific cells deviating from expectation. In addition, it was possible that differences might well arise within those categories - - for instance, Brunner and Carroll (1969) found that the not-at-home rate was higher on Saturdays than on weekday evenings.

The X^2 statistic for Table 1 was 11.102 with 6 degrees of freedom, which was not significant.

The results for Question 2 ("How is cooperation related to the sex of the interviewer?") are illustrated in Table 2. The X^2 statistic for this 2x2 table was 1.67 with 1 degree of freedom, which was not significant.

Finally, the results for Question 3 ("How is the degree of cooperation related to the characteristics of the interviewer?") are illustrated in Table 3. The characteristics here examined refer to the classifications of "staff," "volunteer," or "member." (The major underlying differences among these groups are probably experience and age.) The important categories defining cooperation were completion and refusal - - i.e., cooperation from all eligible respondents who were contacted. The X^2 value for this 3x2 table was .525, with 2 degrees of freedom, which was not significant.

Discussion

The likelihood of contacting targeted households and of completing interviews was not influenced by those properties of the calling situation that were examined. These results add to the confidence that may be placed in the results. If it had turned out, for instance, that youth were more likely to obtain a refusal than adults, the possibility would have to be considered that subtle sampling biases were present in the subsamples reached by the youth and adults, respectively. As it is, there is no evidence of differences in variance contributed by the three interviewed groups or the day of the week on which calls were made.

This should not be misinterpreted to mean that no logistics-based biases are present in the data, however. The refusal rate and non-contact rate both alter the original, randomly selected sample. Speculation about what biases are thus produced must draw on previous published research. O'Neil (1979) provided such an analysis, finding that individuals who refuse to be interviewed tend to be disproportionately lower-SES, less educated and older than those who participate. He also stated, however, that not-at-homes tend to bias the data in the opposite direction, since those individuals tend to be younger, more highly educated, and higher-income. Thus, the omissions of these two groups of potential subjects may compensate somewhat for each other. Furthermore, O'Neil concluded that changes in estimates produced by these biases are typically small, and do not generally alter the research conclusions.

The fact that no differences were found among the three calling sessions is not very surprising, since these times had been selected specifically because of past recommendations. However, the results did contradict Brunner and Carroll (1969), who compared these same periods (weekday evenings vs. Saturday midday) and found that refusals were higher on weekday evenings and not-at-homes were higher on Saturdays.

This study confirms previous findings of no differences in the refusal rates obtained between male and female interviewers (e.g., Dillman et al., 1976). It should help to dispel the general opinion that female interviewers will be more successful than males (a misconception noted by Frey, 1983). An interesting followup question is whether there are interactions between sex of interviewer and sex of respondent to produce differences in refusal rate according to these matchups, but that analysis has not yet been performed on the present data.

Perhaps the most important aspect of the study is its implications for using various groups as interviewers. Although the staff members who participated were not professional interviewers, they were experienced service professionals who had a working knowledge of research procedures (one of the four was indeed a professional researcher); thus at least a moderate degree of confidence in their skills is justified. The fact that they were not demonstrably better in eliciting cooperation than the groups of parents and teenagers speaks well for these latter groups. The support that was provided in the form of carefully written protocols,a prior training session,and continual monitoring of calls in progress - - as well as, perhaps, their familiarity and comfort with the program that formed the survey's subject - - were sufficient to remove any major differences in the elicited cooperation. These results do not imply that these interviewers were thereby the equals of professionals, but the results do lend support to the feasibility of using previously untrained volunteers when other options for conducting a survey are not available. Other reports on the comparison of different levels of interviewer experience are limited. In many studies the interviewers are reported to be students trained on-site or other non-professionals; in such cases the lack of interviewer variability makes this question impossible to investigate. Singer et al. (1983), however, specifically investigated this issue. They found, paradoxically, that refusals were <u>higher</u> for interviewers with more than one year experience than for those with less than one year.

The major value of this study is as a replication, rather than an initial examination, of the questions it investigates. For researchers planning surveys, unique aspects of published studies such as geographic location, affiliation of the survey effort with a commercial, academic, or public service group, and the specific questions asked, will produce variations in respondent cooperation

and availability from what may have been reported elsewhere. Reports that reflect wide variation will therefore be of benefit. In combination with other studies, this study can contribute to a wide empirical research base that allows survey administration decisions to be made with confidence.

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Table 1

Outcomes of Call Attempts for Each Calling Session

Calling Session	Outcome of Call Attempt: Completion	Refusal	No Answer	Busy	Adult Not Home	Total
Saturday	88	38	64	16	14	220
Tuesday	93	31	43	17	8	192
Wednesday	60	30	60	19	10	179
Total	241	99	167	52	32	591

x^2, 6 df, = 11.102, NS.

Table 2

Respondent Cooperation by Sex of Interviewer

Sex of Interviewer	Respoondent Action: Completion	Refusal	Total
Male	77	24	101
Female	164	75	239
Total	241	99	340

x^2, 1 df, = 1.67, NS.

Table 3

Respondent Cooperation for Three Classifications of Telephone Interviewer

Type of Interviewer	Respondent Action: Completion	Refusal	Total
Staff	69	26	95
Adult volunteers	124	50	174
4-H members	48	23	71
Total	241	99	340

X^2, 2 df, = .525, NS